



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/CA99/01189 <b>(22) International Filing Date:</b> 15 December 1999 (15.12.99) <b>(30) Priority Data:</b> 09/210,995 15 December 1998 (15.12.98) US <b>(71) Applicant (for all designated States except US):</b> CONNAUGHT LABORATORIES LIMITED [CA/CA]; 1755 Steeles Avenue West, Toronto, Ontario M2R 3T4 (CA). <b>(71)(72) Applicants and Inventors:</b> LOOSMORE, Sheena, M. [CA/CA]; 70 Crawford Rose Drive, Aurora, Ontario L4G 4R4 (CA). YANG, Yan-Ping [CA/CA]; Apartment 709, 120 Torresdale Avenue, Willowdale, Ontario M2R 3N7 (CA). KLEIN, Michel, H. [CA/CA]; 16 Munro Boulevard, Willowdale, Ontario M2P 1B9 (CA). <b>(74) Agent:</b> STEWART, Michael, I.; Sim & McBurney, 6th floor, 330 University Avenue, Toronto, Ontario M5G 1R7 (CA).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <b>(88) Date of publication of the international search report:</b> 26 October 2000 (26.10.00)
<b>(54) Title:</b> MULTI-COMPONENT VACCINE COMPRISING AT LEAST TWO ANTIGENS FROM HAEMOPHILUS INFLUENZAE  <b>(57) Abstract</b>  <p>A multi-component immunogenic composition confers protection on an immunized host against infection caused by <i>Haemophilus influenzae</i>. Such composition comprises at least two different antigens of <i>Haemophilus influenzae</i>, one of which is an adhesin. High molecular weight (HMW) proteins of non-typeable <i>Haemophilus influenzae</i> enhance the immune response in a host to a non-proteolytic analog of Hin47 protein in such immunogenic compositions with one component not impairing the immunogenicity of the other. The <i>Haemophilus</i> vaccine may be combined with DTP component vaccines to provide a multi-valent component vaccine without impairment of the immunogenic properties of the other antigens.</p>		

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## INTERNATIONAL SEARCH REPORT

International Application No.

PC1/CA 99/01189

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K39/102 A61K39/116 A61K39/295 A61P31/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data, BIOSIS, WPI Data, EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	S. BARENKAMP: "Immunization with high-molecular weight adhesion proteins of nontypeable H. influenzae modifies experimental otitis media in chincillas" INFECT. IMMUN., vol. 64, no. 4, 1996, pages 1246-1251, XP002142962	1-3
Y	Abstract, last sentence. Discussion, last paragraph.	4-26
X	S. LOOSMORE AT AL.: "The H. influenzae Htra protein is a protective antigen" INFECT. IMMUN., vol. 66, no. 3, 1998, pages 899-906, XP002142963	1-3
Y	Discussion, last paragraph.	4-26
	-/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 94 00149 A (MICROCARB INC.) 6 January 1994 (1994-01-06) claims 1-4, 28-30 -----	1
A	WO 97 36914 A (BARENKAMP) 9 October 1997 (1997-10-09) page 7, line 1 - line 4 page 20, line 15 - page 25, line 10 -----	1-26
A	WO 96 03506 A (CONNAUGHT LABORATORIES LED) 8 February 1996 (1996-02-08) page 6, line 29 - page 7, line 10 page 14, line 33 - page 15, line 14 -----	1-26

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 99/01189

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9400149 A	06-01-1994	US 5843463 A	01-12-1998
		AT 176989 T	15-03-1999
		CA 2098598 A	22-06-1992
		DE 69130955 D	08-04-1999
		DE 69130955 T	01-07-1999
		EP 0565590 A	20-10-1993
		ES 2131066 T	16-07-1999
		JP 6508346 T	22-09-1994
		WO 9210936 A	09-07-1992
		US 5721115 A	24-02-1998
		US 5679547 A	21-10-1997
		CA 2138765 A	06-01-1994
		EP 0647139 A	12-04-1995
		JP 2805174 B	30-09-1998
		JP 7509693 T	26-10-1995
WO 9736914 A	09-10-1997	US 5977336 A	02-11-1999
		AU 2587397 A	22-10-1997
		CA 2259133 A	09-10-1997
		EP 0900232 A	10-03-1999
WO 9603506 A	08-02-1996	US 5506139 A	09-04-1996
		US 5939297 A	17-08-1999
		US 5869302 A	09-02-1999
		AU 687619 B	26-02-1998
		AU 3337695 A	22-02-1996
		BR 9506272 A	12-08-1997
		CA 2171611 A	08-02-1996
		CN 1136328 A	20-11-1996
		EP 0729513 A	04-09-1996
		NZ 291750 A	24-10-1997
		US 6025342 A	15-02-2000
		US 6020183 A	01-02-2000
		US 5665353 A	09-09-1997
		US 5935573 A	10-08-1999
		US 5656436 A	12-08-1997
		US 5981503 A	09-11-1999
		US 5962430 A	05-10-1999